AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-16 (Canceled)

17. (New) A method of extracting a radial velocity characteristic of a target from one or more coherent radiation pulse bursts comprising the steps of:

    (a)   receiving radiation echo returns of the pulse bursts from a remote scene;

    (b)   processing the echo returns into in-phase (I) and quadrature (Q) components;

    (c)   measuring returns at intervals to provide sampled data;

    (d)   applying a predetermined function to the I-Q returns;

    (e)   modifying the predetermined function to match the sampled data as a function of velocity; and

    (f)   determining the target radial velocity in dependence upon said modification step of the predetermined function.

18.   (New) A method as claimed in Claim 17 wherein step (d) comprises fitting a curve to the I-Q returns and step (e) comprises optimising the fit to the sampled data as a function of velocity in a least squares fashion.

19.   (New) A method as claimed in Claim 18 wherein a model of clutter return is provided for use in steps (d) and (e).

20.   (New) A method as claimed in Claim 19 wherein the model of clutter return is a low order polynomial function in I and Q.

21.   (New) A method as claimed in Claim 17 further comprising the step of extracting target amplitude from the sampled data.

22.   (New) A method as claimed in Claim 17 further comprising the step of extracting range ambiguity from the sampled data.

23.   (New) A method as claimed in Claim 17 further comprising the step of extracting target azimuth from the sampled data.

24.   (New) A method as claimed in Claim 20 wherein the echo returns are measured at non-equi-spaced intervals.

25.   (New)   A method as claimed in Claim 24 wherein the pulse bursts are transmitted at a frequency which is changed between successive pulses.

26.   (New)   A method as claimed in Claim 24 wherein each pulse burst consists of multiple pulses transmitted at irregular intervals.

27.   (New)   A method as claimed in Claim 24 wherein the pulse bursts are internally coherent but mutually incoherent.

28.   (New)   A method as claimed in Claim 17 further comprising the step of carrying out conventional Moving Target Indication/Moving Target Detection filtering and target detection before applying a predetermined function, as in step (d), to the I-Q returns in which a target was detected.

29.   (New)   A microprocessor programmed to carry out the method of Claim 17.

30.   (New)   A program element comprising program code operable to carry out a method as claimed in Claim 17.

31.   (New)   The program element of Claim 30 on a carrier medium.

32. (New) A data processing system adapted and arranged to carry out a method as claimed in Claim 17 comprising:

(g) a transmitter;

(h) a receiver;

(i) an I and Q component splitter;

(j) an analog-to-digital converter, and

(k) processing means to fit a predetermined function to I and Q components according to steps (d) and (e).

33. (New) A method as claimed in Claim 17 wherein a model of clutter return is provided for use in steps (d) and (e).

34. (New) A method as claimed in Claim 33 wherein the pulse bursts are transmitted at a frequency which is changed between successive pulses.

35. (New) A method as claimed in Claim 33 wherein each pulse burst consists of multiple pulses transmitted at irregular intervals.

36. (New) A method as claimed in Claim 33 wherein the pulse bursts are internally coherent but mutually incoherent.